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09/841,646	04/24/2001	Katsunori Komori	10873.690US01	6442

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EXAMINER	
CANTELMO, GREGG	
ART UNIT	**PAPER NUMBER**
1745	8

DATE MAILED: 01/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/841,646	Applicant(s) KOMORI ET AL.	
	Examiner Gregg Cantelmo	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 January 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) *13-15* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 April 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

1. Claims 13-15 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected battery, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 7.

2. Applicant's election with traverse of the restriction of claims 13-15 in Paper No. 7 is acknowledged. The traversal is on the ground(s) that the claims of Group I are allowable and therefore the claims of Group II should also be held allowable. This is not found persuasive because: (a) the Examiner has not indicated that any of claims 1-12 are allowable and (b) there are distinct claim limitations in Groups I and II and even if allowable subject matter were indicated in the claims of Group I, such may not be applicable to Group II if the allowable subject matter is not recited in the claims of Group II. The requirement is still deemed proper and is therefore made FINAL.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

4. The information disclosure statement filed August 9, 2001 has been placed in the application file and the information referred to therein has been considered as to the merits.

Drawings

5. The drawings received April 24, 2001 are acceptable for examination purposes.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. Claim 1 recites the limitation "the time the battery is activated" in lines 7-8. There is insufficient antecedent basis for this limitation in the claim. The term “the time” should be amended to --a time-- to overcome this rejection. This also applies to claims 7 (see the last line of the claim).

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1 and 7 rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,378,414 (Furukawa).

Furukawa discloses an alkaline storage battery (title) comprising: a case 7, a positive electrode, 5, a negative electrode 1, a composite layer separator 3 and 4 (Fig. 1) and an electrolyte (col. 3, ll. 65-68) provided in the case, wherein an amount of the electrolyte retained in the separator is at least 15mg/cm^2 (Table 2, examples 6-9, 12 and 13). The electrolyte is poured into the case and absorbed and retained in the separator and electrodes in an amount of 1-10 mg/cm^2 in the separator layer adjacent to the negative electrode and 11.0 mg/cm^2 or more in the separator layer adjacent to the positive electrode. Thus the content of the electrolyte absorbed into the separator during the pouring process provides electrolyte contents within the ranges disclosed above and shown in examples 6-9, 12 and 13 in Table 2 (col. 2, line 67 through col. 3, line 20 as applied to claim 1).

Furukawa discloses an alkaline storage battery (title) comprising: a case 7, a positive electrode, 5, a negative electrode 1, a composite layer separator 3 and 4 (Fig. 1) and an electrolyte (col. 3, ll. 65-68) provided in the case, wherein an amount of the electrolyte retained in the separator is at least 20 mg to 1 cm^2 (Table 2, examples 6-9, 12 and 13). The electrolyte is poured into the case and absorbed and retained in the separator and electrodes in an amount of 1-10 mg/cm^2 in the separator layer adjacent to the negative electrode and 11.0 mg/cm^2 or more in the separator layer adjacent to

the positive electrode. Thus the content of the electrolyte absorbed into the separator during the pouring process provides electrolyte contents within the ranges disclosed above and shown in examples 6-9, 12 and 13 in Table 2 (col. 2, line 67 through col. 3, line 20 as applied to claim 7).

Claim Rejections - 35 USC § 102/103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 3 and 9 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Furakawa.

Claims 3 and 9 recite a process of pouring the electrolyte into the case. There does not appear to be any further definition of the product of claims 1 and 7 respectively.

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted).

"The Patent Office bears a lesser burden of proof in making out a case of prima facie obviousness for product-by-process claims because of their peculiar nature" than when a product is claimed in the conventional fashion. In re Fessmann, 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). Ex parte Gray, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989). See MPEP section 2113.

"[T]he lack of physical description in a product-by-process claim makes determination of the patentability of the claim more difficult, since in spite of the fact that the claim may recite only process limitations, it is the patentability of the product claimed and not of the recited process steps which must be established. We are therefore of the opinion that when the prior art discloses a product which reasonably appears to be either identical with or only slightly different than a product claimed in a product-by-process claim, a rejection based alternatively on either section 102 or section 103 of the statute is eminently fair and acceptable. As a practical matter, the Patent Office is not equipped to manufacture products by the myriad of processes put before it and then obtain prior art products and make physical comparisons therewith." In re Brown, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972).

Claim Rejections - 35 USC § 103

13. Claims 2 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furakawa in view of JP 05 121061 A (JP '061).

The teachings of claims 1 and 7 have been discussed above and are incorporated herein (applied to claims 2 and 8, respectively).

The difference between claims 2 and 8 and Furukawa is that Furukawa does not disclose forming a separator of sulfonated polypropylene, and sulfur to carbon atoms in the separator satisfy the relationship of: the number of sulfur atoms / the number of carbon atoms = A wherein $2.0 \times 10^{-3} \leq A \leq 5.5 \times 10^{-3}$.

JP '061 discloses that it is desired to use a sulfonated polypropylene separator in an alkaline storage battery wherein the ratio of sulfur atoms to carbon atoms is in a range from 0.15×10^{-2} to 0.40×10^{-2}, this range equivalent to a range from 1.5×10^{-3} to 4.0×10^{-3} (page 3, col. 4, ll. 24-31).

The motivation for providing a sulfonated polypropylene separator in an alkaline storage battery wherein the ratio of sulfur atoms to carbon atoms is in a range from 0.15 $\times 10^{-2}$ to 0.40×10^{-2}, this range equivalent to a range from 1.5×10^{-3} to 4.0×10^{-3} is that it optimizes the absorbance of the electrolyte in the separator and tensile strength of the separator. Thus a separator having a sulfur to carbon ratio as taught by JP '061 has both improved electrolyte absorbance and tensile strength.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Furakawa by providing a sulfonated polypropylene separator in an alkaline storage battery wherein the ratio of

sulfur atoms to carbon atoms is in a range from 0.15×10^{-2} to 0.40×10^{-2}, this range equivalent to a range from 1.5×10^{-3} to 4.0×10^{-3}, since it would have optimized the absorbance of the electrolyte in the separator and tensile strength of the separator. Thus the separator of Furakawa having a sulfur to carbon ratio as taught by JP '061 would have had both improved electrolyte absorbance and tensile strength.

14. Claims 3 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furakawa in view of JP 07 099050 A (JP '050)

In the event that the 102/103 rejection of claims 3 and 9 above is overcome:

The teachings of claims 1 and 7 have been discussed above and are incorporated herein (applied to claims 3 and 9, respectively).

The difference between claims 3 and 9 and Furukawa is that Furukawa does not disclose providing the electrolyte via a vacuum atmosphere.

Introducing the electrolyte into the cell by a vacuum injection is well known in the art as evidenced by JP '050 (abstract).

The motivation for providing an electrolyte to the cell by using a vacuum injection technique is that it reduces the electrolyte permeating period, pours the electrolyte to a precise quantity and raises the performance reliability of the cell (abstract).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Furakawa by providing an electrolyte which is vacuum injected since it would have reduced the electrolyte permeating period, poured the electrolyte to a precise quantity and raised the performance reliability of the cell.

15. Claims 4 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furakawa in view of JP 52 070131 A (JP '131).

The teachings of claims 1 and 7 have been discussed above and are incorporated herein (applied to claims 4 and 10, respectively).

The difference between claims 4 and 10 and Furukawa is that Furukawa does not disclose of the separator having a specific surface area ranging from 0.6 m^2/g to 0.9 m^2/g.

JP '131 is drawn to separators used in a secondary battery wherein the characteristics of the separator are optimized. In particular the separator has a specific surface area of 0.4 m^2/g or greater (abstract and claim 2). In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919, F.2d 1575, 16 USPQ 2d 1934 (Fed. Cir. 1990).

The motivation for configuring the separator to have a specific surface area of 0.4 m^2/g or greater is that it provides a separator design which has high mechanical strength and improved ion transmittance (abstract).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Furakawa by configuring the separator to have a specific surface area of 0.6 m^2/g to 0.9 m^2/g since it would have provided a separator design which has high mechanical strength and improved ion transmittance.

16. Claims 5, 6, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furakawa in view of U.S. patent No. 4,137,379 (Schmidt).

The teachings of claim 1 have been discussed above and are incorporated herein (applied to claims 5 and 6). The teachings of claim 7 have been discussed above and are incorporated herein (applied to claims 11 and 12).

The differences between claims 5, 6, 11 and 12 and Furakawa are that Furakawa does not disclose of the separator having a median pore diameter of not larger than 30 microns on a volume basis when pores are measured in a range of 0.1 microns to 360 microns with a mercury porosimeter (claims 5 and 11) or of the separator having a median pore diameter of not larger than 30 microns on a volume basis when pores are measured in a range of 0.1 microns to 360 microns with a mercury porosimeter (claims 6 and 12).

With respect to claims 5 and 11:

Schmidt discloses that it is desirable to have a porous polyolefin separator having an average pore size from about 0.5 to 15 microns and preferably about 1 to 10 microns (col. 2, ll. 44-49). In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919, F.2d 1575, 16 USPQ 2d 1934 (Fed. Cir. 1990).

The motivation for having a porous polyolefin separator having an average pore size from about 0.5 to 15 microns and preferably about 1 to 10 microns is that it provides a separator having excellent mechanical and electrical properties.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Furakawa by selecting the average pore diameter to be from about 0.5 to 15 microns and preferably about 1 to 10 microns since it would have provided a separator having excellent mechanical and electrical properties.

With respect to claims 6 and 12:

Schmidt discloses that it is desirable to have a porous polyolefin separator with a weight of about 20-100 g/m^2 (col. 2, ll. 44-45). In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919, F.2d 1575, 16 USPQ 2d 1934 (Fed. Cir. 1990).

The motivation for having a porous polyolefin separator polyolefin separator with a weight of about 20-100 g/m^2 is that it provides a separator having excellent mechanical and electrical properties.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Furakawa by selecting polyolefin separator with a weight of about 20-100 g/m^2 since it would have provided a separator having excellent mechanical and electrical properties.

17. Claims 6 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furakawa in view of U.S. patent No. 5,032,475 (Hasebe).

The teachings of claims 1 and 7 have been discussed above and are incorporated herein (applied to claims 6 and 12, respectively).

The difference between claims 6 and 12 and Furukawa is that Furukawa does not disclose forming a separator of having a weight per unit area from 60 g/m^2 to 85 g/m^2.

Hasebe discloses that separators used in alkaline batteries are preferably designed to have a weight per unit area between 50 and 100 g/m^2 (col. 6, ll. 27-30).

If the texture is less than 50 g/m^2 the exhaustion of the electrolyte within the separator will be accelerated during the charge and discharge operation thus causing the life of the cell to be reduced. If the texture exceeds 100 g/m^2 the volume of the separator will increase. Accordingly the space for holding the alkali electrolyte becomes smaller and the exhaustion of the electrolyte at an early stage of the charge and discharge operation will occur (col. 6, ll. 30-44). In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919, F.2d 1575, 16 USPQ 2d 1934 (Fed. Cir. 1990).

The motivation for providing a separator of having a weight per unit area from 60 g/m^2 to 85 g/m^2 is that it provides a separator having an optimal weight per unit area that prevents premature exhaustion of the electrolyte from the separator during charge and discharge operation of the cell.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Furakawa by providing separator having an density per unit area within a separator of having a weight per unit area from 60 g/m^2 to 85 g/m^2 since it would have provided a separator having an optimal weight per unit area that prevents premature exhaustion of the electrolyte from the separator during charge and discharge operation of the cell.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is (703) 305-0635. The examiner can normally be reached on Monday through Thursday from 8:00 a.m. to 5:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan, can be reached on (703) 308-2383. FAX communications should be sent to the appropriate FAX number: (703) 872-9311 for After Final Responses only; (703) 872-9310 for all other responses. FAXES received after 4 p.m. will not be processed until the following business day. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Gregg Cantelmo
Patent Examiner
Art Unit 1745

gc

Gregg Cantelmo

January 25, 2003